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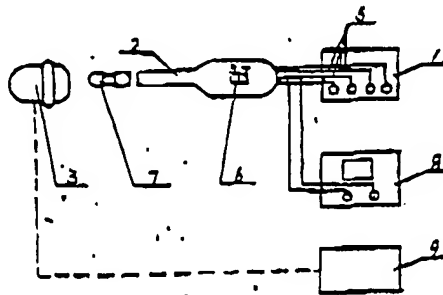
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[54] Name of Invention: Fallopian Tube Plug and Its Insertion System

[57] Abstract

This is a fallopian tube plug and its insertion system used for female contraception. Its special characteristic is that the fallopian tube plug uses memory alloy to make a U-shaped semi-sealed structure, the fallopian tube plug insertion system is composed from an inserter as well as an electronic temperature regulating device

providing heat and cold sources which is connected with it. The inserter is used to place the fallopian tube plug into the fallopian tube, it realizes thermal difference modification and local expansion, and attains the goal of obstructive contraception. It has high reliability, is not harmful to the human body, it will not cause any physiological side-effects, and it is able to resolve the problem of giving birth again which cannot be resolved with ligation and sterilization with chemical cauterization.



Claims

1. The special characteristic of the fallopian tube plug and its insertion system is that the fallopian tube plug referred to is a U-shaped semi-sealed structure.

2. The special characteristic of the fallopian tube plug and its insertion system described in Claim 1 of the patent is that the fallopian tube plug referred to is manufactured with memory alloy.

3. The special characteristic of the fallopian tube plug and its insertion system described in Claims 1 and 2 of the patent is that the root segment of the fallopian tube plug referred to is spiral-shaped.

4. The special characteristic of the fallopian tube plug and its insertion system described in Claims 1 and 2 of the patent is that the root segment of the fallopian tube plug referred to is convex.

5. The special characteristic of the fallopian tube plug and its insertion system described in Claims 1 and 2 of the patent is that the root segment of the fallopian tube plug referred to is concave.

6. The special characteristic of the fallopian tube plug and its insertion system is that the insertion system referred to is composed from an inserter as well as a temperature regulating device providing heat and cold sources which is connected with it. The inserter includes a modified clamping head (7) which is used to clamp the fallopian tube plug, the root segments of heat conduction tube (4) and modified clamping head (7), and the external segment of heat conduction tube (4) connected behind separately use heat insulation tubes (10) and (11). Heat conduction tube (4) can connect with heat conduction tube (5). Its connecting end is equipped with a lock device (12), and the heat conduction tube (5) and switch (6) controlling the cooling and heating of the electronic temperature controlling device are placed inside the handle (13) of the inserter.

7. The special characteristic of the fallopian tube plug and its insertion system described in Claim 6 of the patent is that the modified clamping head (7) referred to is manufactured with memory alloy.

8. The special characteristic of the fallopian tube plug and its insertion system described in Claim 6 of the patent is that the heat conduction tube (4) referred to is manufactured with memory alloy.

9. The special characteristic of the fallopian tube plug and its insertion system described in Claim 6 of the patent is that the heat conduction tube (5) referred to is manufactured with memory alloy.

Explanations

Fallopian Tube Plug and Its Insertion System

This invention involves a type of contraceptive device and insertion system.

Existing female contraceptive methods include the insertion of intrauterine devices, the oral taking or injection of contraceptive drugs, and the performance of tubal sterilization with chemical cauterization and ligation of the fallopian tube.

Intrauterine devices do not utilize the inhibition of the pituitary gland of the hypothalamus and the ovary axis but are foreign objects which have contraceptive action by means of local effects. Aside from the mechanical effects, the endometrium has a type of light, slow and non-bacterial inflammatory reaction which changes the characteristics of the endometrial secretions and thus contraceptive effects are realized. The side effects of this type of contraception are:

1. Hemorrhaging: after implanting the intrauterine device, and owing to the increase in the activity of fibrinolysin, some patients may have irregular vaginal bleeding or shortened menstrual periods, or the menstrual period is lengthened and there is increased flow of blood.

2. Mild lumbago and abdominal dropping: when the selected contraceptive device is too small, this easily causes dropping, and when the contraceptive device is too large or when the operator does not place the contraceptive device on the bottom of the uterus but rather on the lower part of the uterus, this can result in uterine contractions and cause mild lumbago and abdominal dropping.

In addition, the above mentioned contraceptive methods can also cause incarceration of the contraceptive device, perforation of the uterus, uterine infections, and other illnesses.

Orally taken or injected contraceptive drugs mainly change the consistency of the cervical mucus by means of inhibiting ovulation. Influencing the normal changes of the endometrium is not advantageous to implantation of ovum and attaining the goal of contraception. The side effects of this type of contraception are:

1. Reactions similar to morning sickness: after swallowing the drug, there can be nausea, dizziness, weakness, loss of appetite, fatigue, and vomiting.
2. Influence on menstrual period: the menstrual period is lengthened or there is menolipsis; breakthrough bleeding.
3. Increase in leukorrhea: increase in leukorrhea seen quite often.

Ligation of the fallopian tubes and tubal sterilization with chemical cauterization are birth control methods used for permanent sterility. The drawbacks of these types of contraception are:

Aside from certain side effects, the reasons for failure are the reconnection caused by incorrect ligation and the chemical properties of the mucus blockage agent.

The goal of this invention is to design a type of expansive plug which is placed in the fallopian tube by means of a specially made insertion system, and through temperature difference distortion and local expansion, the goal of incarcerated contraception is accomplished. It possesses high reliability, is not harmful to the human body, will not cause physiological side effects, and it is able to resolve the problem of giving birth again which cannot be resolved with ligation and sterilization with chemical cauterization.

The fallopian tube plug of this invention is designed based on the specific features of memory alloy contraction upon contact with cold and expansion upon contact with hot.

The fallopian tube plug of this invention which uses memory alloy to make a U-shaped semi-sealed structure is placed between the interstitial portion of the fallopian tube and the isthmus portion of the fallopian tube. The plug which is at a basic temperature prior to distortion is first placed in the normal range of human body temperature (distortion does not occur below 36°C), and after the plug separates from the inserter, it rapidly expands with the body temperature to within a designated expansion range.

The fallopian tube plug inserter of this invention is designed based on the memory alloy expanding upon encountering cold and shrinking upon encountering heat.

The fallopian tube plug inserter of this invention is controlled with an electronic cold stimulation device which brings about coordination of the inserter expanding upon encountering cold and the plug shrinking when encountering cold; it is controlled with an electronic heater which causes the inserter to shrink upon encountering cold and the plug to expand upon encountering heat, and the two fall off and separate when the space enlarges.

The insertion system of the fallopian tube plug of this invention is composed from the inserter and an electronic temperature controlling device which provides a source of cold and is connected with it.

Below, we will present detailed explanations of the attached drawings to elucidate the structural and operating principles of this invention:

Attached Drawing 1 is a drawing of the insertion system of the fallopian tube plug.

Attached Drawing 2 is a drawing of the structural principle of the inserter (2).

Attached Drawing 3 is a drawing of an actual example of implementation of the fallopian tube plug.

In Drawing 1: (1) is the electronic temperature control device, (2) is the plug inserter, and (3) is the fallopian tube plug. The heat conduction tube (5) in the tail end of the inserter (2) is connected to the outlet of the heat and cold of the electronic temperature control device (1). The inserter is fitted with a switch (6) controlling the cooling and heating of the electronic temperature controlling device (1), and the clamping head of the plug is equipped with a microvideo signal switch which is connected with the input end of a microvideo pick-up camera (8). The intermediate frequency X ray machine (9) is a configured device for measuring the position of the plug.

In Drawing 2: (7) is used to clamp the modified clamping head of the fallopian tube plug. The base portion of the modified clamping head (7) and the external segment of heat conduction tube (4) connected behind separately use heat insulation tubes (10) and (11). Heat conduction tube (4) can connect with heat conduction tube (5). Its connecting end is equipped with a lock device (12), and the heat conduction tube (5) and switch (6) are installed inside the handle (13) of the installer. The modified clamping head (7), heat conduction tube (5) and heat conduction tube (4) are all made with memory alloy.

Drawing 3 is the fallopian tube plug with U-shaped semi-sealed structure. Within this, (a) is the base portion which is helical, the location effects are good, and it is able to prevent the passage of sperm in layers. (b) is the common shape and manufacture is simple. The base portion of (c) is convex. The base portion of (d) is concave and yet the location effects are good and it is easy to remove.

The operating process of this invention is: (using Drawing 2 as an example), the fallopian tube plug is first slipped on the modified clamping head (7), the heat conduction tube is attached on the cold and heat outlet of the electronic temperature control device (1), and the switch (6) is also connected with the electronic temperature control device

(1). Afterwards, the power supply is connected and the switch (6) is placed in the cooling position. After precooling for a certain amount of time, the fallopian tube plug and modified clamping head (7) are clamped together, and then the inserter (2) sends the fallopian tube plug in between the interstitial portion of the fallopian tube and the isthmus portion of the fallopian tube. Afterwards, the switch (6) is placed in the heating position, the fallopian tube plug expands, the modified clamping head (7) shrinks, and the two separate. The inserter (2) is removed, the power is turned off, and the entire insertion process has been completed. The operating process for removing the fallopian tube plug is the same as the operating process for insertion.

During the operating process, a microvideo pick-up camera screen display device is used to monitor the operating process of insertion. An intermediate frequency X-ray machine is used to clinically monitor the position and activities of the fallopian tube plug.

It can be seen from this that, owing to the realization of temperature difference distortion and local expansion of the fallopian tube plug during the insertion process, there are no mechanical injuries to the human body. Further, the memory alloy has no side effects on the human body, the fallopian tube plug is inserted in a specially designated location, and thus not only does it possess high reliability and not cause any physiological side effects, but it is also able to resolve the problem of not being able to give birth again with sterilization with chemical cauterization and ligation.

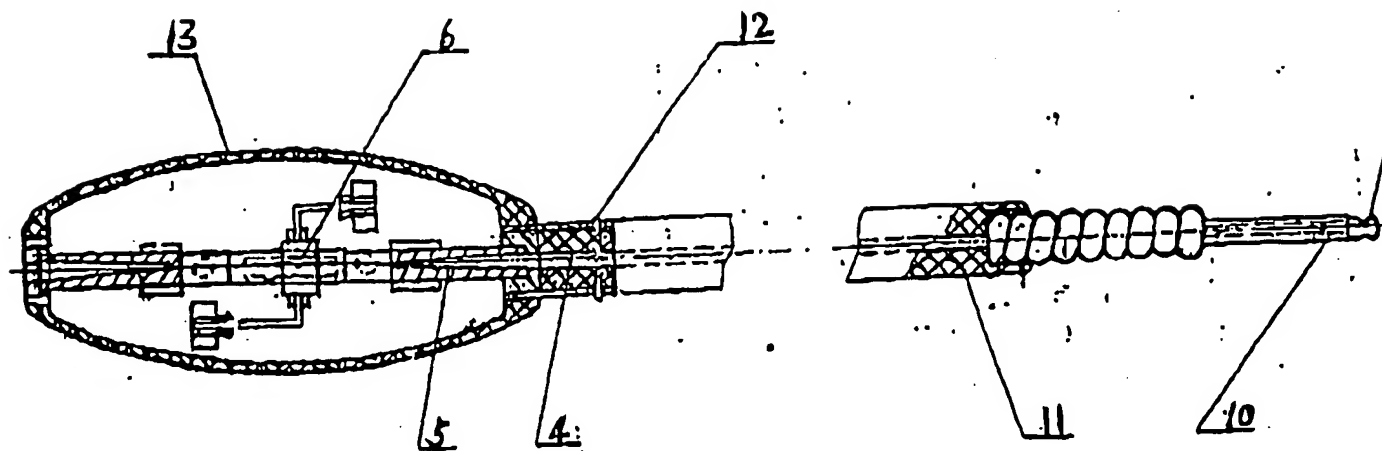
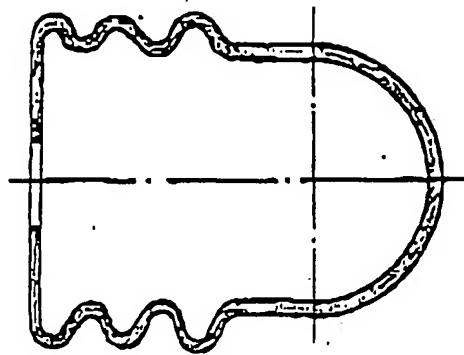
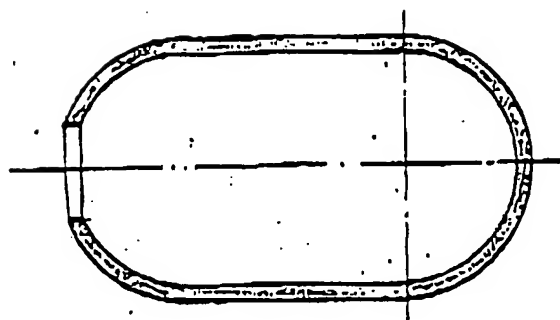


Figure 2

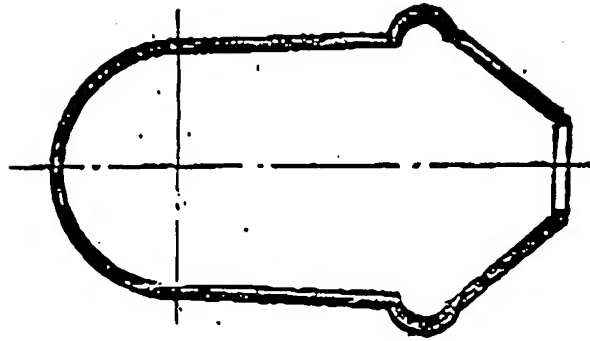


(a)

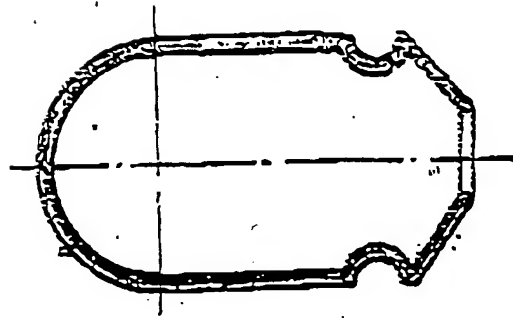


(b)

Figure 3 (a,b)



(c)



(d)

Figure 3 (c,d)